

CLAIMS

1. A method of assessing communication quality in a wireless network comprising a plurality of access points, said method comprising:

5 receiving as input path loss information indicating path losses between a selected client of said wireless network and said access points;

based on said path loss information, determining a capacity indicator that estimates communication impairment for said client due to contention or collision;

10 based on said path loss information, determining a data rate indicator that estimates an achievable data rate for communication by said selected client;

determining a cell loading indicator that estimates communication impairment due to overloading of a cell occupied by said selected client; and

based on said capacity indicator, said data rate indicator, and said cell loading indicator, determining a client throughput.

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2. The method of claim 1 wherein determining said client throughput comprises multiplying said capacity indicator by said data rate indicator and said cell loading indicator.

3. The method of claim 1 further comprising:

repeating said receiving, determining a capacity indicator, determining a data rate indicator, and determining a client throughput for a plurality of clients; and

5 determining a combined quality metric as a reciprocal of an average of reciprocals of client throughputs determined for said plurality of clients.

4. The method of claim 1 wherein determining a capacity indicator comprises:

10 determining a downstream capacity indicator for an access point associated with said selected client;

determining an upstream capacity indicator for said selected client; and

calculating said capacity indicator as a weighted sum of said downstream capacity indicator and said upstream capacity indicator.

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5. The method of claim 4 wherein said downstream capacity indicator takes into account contention by said associated access point with other access points, contention by said access point with clients other than said selected client, and collision by said associated access point with other access points.

6. The method of claim 5 wherein said upstream capacity indicator takes into account contention by said selected client with access points other than said associated access point and collisions by said selected client with access points other than said associated access point.

7. Apparatus for assessing communication quality in a wireless network comprising a plurality of access points, said apparatus comprising:

10 means for receiving as input path loss information indicating path losses between a selected client of said wireless network and said access points;

means for, based on said path loss information, determining a capacity indicator that estimates communication impairment for said client due to contention or collision;

15 means for, based on said path loss information, determining a data rate indicator that estimates an achievable data rate for communication by said selected client;

means for, determining a cell loading indicator that estimates communication impairment due to overloading of a cell occupied by said selected client; and

means for, based on said capacity indicator, said data rate indicator, and said cell loading indicator, determining a client throughput.

8. The apparatus of claim 7 wherein said means for determining said client throughput comprises means for multiplying said capacity indicator by said data rate indicator and said cell loading indicator.

9. The apparatus of claim 7 further comprising:

means for repeating said receiving, determining a capacity indicator, determining a data rate indicator, and determining a client throughput for a plurality of clients; and

means for determining a combined quality metric as a reciprocal of an average of reciprocals of client throughputs determined for said plurality of clients.

10. The apparatus of claim 7 wherein said means for determining a capacity indicator comprises:

means for determining a downstream capacity indicator for an access point associated with said selected client;

means for determining an upstream capacity indicator for said selected client; and

means for calculating said capacity indicator as a weighted sum of said downstream capacity indicator and said upstream capacity indicator.

11. The apparatus of claim 10 wherein said downstream capacity indicator takes into account contention by said associated access point with other access points,
5 contention by said access point with clients other than said selected client, and collision by said associated access point with other access points.

12. The apparatus of claim 11 wherein said upstream capacity indicator takes into account contention by said selected client with access points other than said
10 associated access point and collisions by said selected client with access points other than said associated access point.

13. A computer program product for assessing communication quality in a wireless network comprising a plurality of access points, said product comprising:

code that causes receipt of path loss information indicating path losses between a
15 selected client of said wireless network and said access points;

code that causes, based on said path loss information, determination of a capacity indicator that estimates communication impairment for said client due to contention or collision;

code that causes, based on said path loss information, determination of a data rate
20 indicator that estimates an achievable data rate for communication by said selected client;

code that causes determination of a cell loading indicator that estimates communication impairment due to overloading of a cell occupied by said selected client;

code that causes, based on said capacity indicator, said data rate indicator, and
5 said cell loading indicator, determination of a client throughput; and

a computer-readable storage medium that stores the codes.

14. The product of claim 13 wherein said code that causes determination of said client throughput comprises code that causes multiplication of said capacity indicator
10 by said data rate indicator and said cell loading indicator.

15. The product of claim 13 further comprising:

code that causes repeated application of said code that causes receiving, code that causes determination of a capacity indicator, code that causes determination of a data rate
15 indicator, and code that causes determination of a client throughput for a plurality of clients; and

code that causes determination of a combined quality metric as a reciprocal of an average of reciprocals of client throughputs determined for said plurality of clients.

16. The product of claim 13 wherein said code that causes determination of a capacity indicator comprises:

code that causes determination of a downstream capacity indicator for an access
5 point associated with said selected client;

code that causes determination of an upstream capacity indicator for said selected client; and

code that causes calculation of said capacity indicator as a weighted sum of said downstream capacity indicator and said upstream capacity indicator.

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17. The product of claim 16 wherein said downstream capacity indicator takes into account contention by said associated access point with other access points, contention by said access point with clients other than said selected client, and collision by said associated access point with other access points.

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18. The product of claim 17 wherein said upstream capacity indicator takes into account contention by said selected client with access points other than said associated access point and collisions by said selected client with access points other than said associated access point.

19. Apparatus for assessing communication quality in a wireless network comprising a plurality of access points, said apparatus comprising:

a processor; and

5 a memory device storing instructions for execution by said processor, said instructions comprising:

code that causes receipt of path loss information indicating path losses between a selected client of said wireless network and said access points;

code that causes, based on said path loss information, determination of a
10 capacity indicator that estimates communication impairment for said client due to contention or collision;

code that causes, based on said path loss information, determination of a data rate indicator that estimates an achievable data rate for communication by said selected client;

15 code that causes determination of a cell loading indicator that estimates communication impairment due to overloading of a cell occupied by said selected client; and

code that causes, based on said capacity indicator, said data rate indicator, and said cell loading indicator, determination of a client throughput.

20. The apparatus of claim 19 wherein said code that causes determination of
said client throughput comprises code that causes multiplication of said capacity indicator
5 by said data rate indicator and said cell loading indicator.

21. The apparatus of claim 19 wherein said instructions further comprise:

code that causes repeated application of said code that causes receiving, code that
causes determination of a capacity indicator, code that causes determination of a data rate
10 indicator, and code that causes determination of a client throughput for a plurality of
clients; and

code that causes determination of a combined quality metric as a reciprocal of an
average of reciprocals of client throughputs determined for said plurality of clients.

15 22. The apparatus of claim 19 wherein said code that causes determination of
a capacity indicator comprises:

code that causes determination of a downstream capacity indicator for an access
point associated with said selected client;

code that causes determination of an upstream capacity indicator for said selected
20 client; and

code that causes calculation of said capacity indicator as a weighted sum of said downstream capacity indicator and said upstream capacity indicator.

5 23. The apparatus of claim 22 wherein said downstream capacity indicator takes into account contention by said associated access point with other access points, contention by said access point with clients other than said selected client, and collision by said associated access point with other access points.

10 24. The apparatus of claim 23 wherein said upstream capacity indicator takes into account contention by said selected client with access points other than said associated access point and collisions by said selected client with access points other than said associated access point.

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